

Semester IV

Food Microbiology

Objectives

The course enables the students to-

1. To understand the nature and the role of microorganisms in food.
2. To have a knowledge of the basic principles of food sanitation and safety.
3. To acquire a perspective of the importance of microorganisms in environmental microbiology.

	Subject	Total Credits	Th	Pr	Int	Ext	Total
	Food Microbiology	4	2	2	25	75	100

Food Microbiology Theory

Module No	Objectives	Content	Evaluation
1	<p>This module will enable the students to :</p> <ol style="list-style-type: none">1. To be acquainted with microorganisms important in food2. To understand their characteristics in relation to preservation and spoilage of food3. To have a knowledge of the various sources of contamination	<p>Food Microbiology –Basic concepts and History in brief</p> <p>General characteristics</p> <ul style="list-style-type: none">• Morphological Characteristics• Reproductive characteristics• Physiological characteristics• Molds of industrial importance <p>Molds, Yeasts and Bacteria</p> <p>Brief introduction to the following: Viruses,Algae and Parasites</p> <p>Sources And Types Of Contamination</p> <p>Water</p> <ul style="list-style-type: none">• Microbial flora-(types of micro organisms)• Water -As a source of contamination• Water purification• Microbial examination• Indicator organisms	25 Marks Assignments / Presentations

		<ul style="list-style-type: none"> • Water borne illnesses- (names) • Microbial flora • Sources of contamination <p>Sewage</p> <ul style="list-style-type: none"> • Introduction Sewage as a source of contamination • Sewage treatment (brief) <p>Air</p> <ul style="list-style-type: none"> • Air micro flora • Air as a source of contamination <p>Other Sources of contamination</p> <ul style="list-style-type: none"> • Humans, Pests, Animals, Birds and Inanimate objects <p>Food safety Basic concepts of Physical, Chemical and Biological hazards associated with foods.</p> <p>Sanitation in Food Service Establishment</p> <ol style="list-style-type: none"> 1. Cleansing agents, Disinfectants & sanitizers used in Food service Establishment. 2. Personal hygiene <ul style="list-style-type: none"> • The food handler • Cleanliness with regard to hand, habits, working attire/cloths, jewellery, • Health of a food handler 3. HACCP Principles, Need and benefits 	
2	<p>This module will enable the students to :</p> <ol style="list-style-type: none"> 1. Understand the beneficial effects of micro-organisms 2. Food Spoilage and pathogenesis of micro-organisms 	<p>Micro Organisms and Food: Beneficial effects of microorganisms. Microorganisms responsible for commercial production of acid, alcohols, solvents, antibiotics, vitamins, hormones, enzymes, amino acid etc.</p> <p>1. Microbial fermentation and role of micro organisms in Food fermentations</p> <ul style="list-style-type: none"> • Beer, Wine, Bread • Indian pickles • Fermented dairy products - curd, yoghurt and cheese • Vinegar <p>Indian fermented products –idli, dhokla and khaman.</p>	<p>25 Marks</p> <p>New research developments in fermentation technology Assignments / Presentations</p>

		<p>2. Food Spoilage And Food Borne Diseases</p> <p>(1) Contamination and spoilage of cereals, grains and cereal products.</p> <p>(2) Contamination and spoilage of meat and meat products.</p> <p>(3) Contamination and spoilage of milk and milk products.</p> <p>Food Poisoning and Infections:</p> <p>Definitions and differentiation between:</p> <ul style="list-style-type: none"> ➤ Food poisoning and infections. ➤ Salmonella and Botulism ➤ E.coli and S. aureus 	
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References

1. Frazier, W. C. and Westhoff, D. (1988) Food Microbiology .Tata McGraw-Hill
2. Guthrie, R. K. (1972) Food sanitation Inc. Eaglewood Cliff, N.J
3. Jay, 1978. Modern food microbiology. Van Nostr and Reinhold Company, New York
4. Marriot. N.G. (1995) Principles of Food Sanitation .4th edition Edward Arnold
5. Pelczar, M. L. and R.D Reid (1972) Microbiology. McGraw & Hill, New York
6. Reid, G. [ed] 1982. Prescott and Dunn's industrial microbiology AVI Publishing Co., Inc ., Westport , Conn
7. Stanier, R.Y., E.A. Adelberg and Ingraham .1976 .The microbial world .4th ed. Prentice Hall.

Food Microbiology Practical

Objectives

This course will enable students to:

1. To understand the principles, working and use of various equipments.
2. To have knowledge of the underlying principles in practical food microbiology.
3. To develop awareness about the different techniques used for isolation and primary identification of microorganisms.

Module No	Objectives	Contents	Evaluaiton
1	<p>The module will enable the student to:</p> <ol style="list-style-type: none"> 1. To have a knowledge of the commonly used staining techniques. 2. To make the student familiar with the various culture media 	<p>Study of laboratory equipments - Principle, working and use of Microscope, Autoclave, Incubator, Refrigerator, colony counter.</p> <ol style="list-style-type: none"> 1. Study of motility: Hanging drop preparation. 2. Staining techniques: Simple staining Gram staining Spore staining Capsule staining 3. Preparation of culture media composition and uses. 	<p>Performing Practical 15 marks</p>
2	<p>The module will enable the student to:</p> <ol style="list-style-type: none"> 1. To enable students to isolate micro-organisms fro different soures. 2. To make a preliminary identification of some micro-organisms 	<p>Isolation and observation of fungi</p> <ol style="list-style-type: none"> 1. Isolation of bacteria: Using serial dilution streak plate and pour plate techniques: <ul style="list-style-type: none"> • From air • From soil 2. Bacteriological Analysis of Water. 3. Bacteriological analysis of milk. 4. Test for surface sanitation. 5. Permanent slides of pathogenic micro organisms 	<p>Performing practical 10 marks</p>

References

1. Frazier ,W.C, and Westhoff, D.1988 Food Microbiology. Tata Mc. Graw-Hill
2. Guthrie,R.K.[ed] (1972)Food sanitation Inc. Eaglewood Cliff, N. J
3. Jay,1978.Modern food microbiology. Van Nostrand Reinhold Company ,New York
4. Marriot. N.G. (1995)Principles of Food Sanitation .4th edition Edward Arnold
5. Pelczar, M.L. and R.D Reid -1972 Microbiology, Mc. Graw and Hill, New York
6. Reid,G.[ed](1982) Prescott and Dunn's industrial microbiology AVI Publishing Co.,Inc ., Westport ,Conn
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